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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/632,009	07/31/2003	Chongying Xu	ATMI-537-CIP	9371
25559	7590	07/26/2005	EXAMINER	
ATMI, INC. 7 COMMERCE DRIVE DANBURY, CT 06810			DANG, PHUC T	
			ART UNIT	PAPER NUMBER

2818

DATE MAILED: 07/26/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/632,009

Applicant(s)

XU ET AL.

Examiner

PHUC T DANG

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on amendment filed April 21, 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-115 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 9-51, 60-67, 103-106 and 109-115 is/are allowed.
- 6) ☒ Claim(s) 1, 3-8, 52, 54-59 and 72-75 is/are rejected.
- 7) ☒ Claim(s) 2, 53, 68-71 and 76-102 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____

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DETAILED ACTION

1. This application is a CIP of 10/303,479 filed on November 25, 2002 which claims benefit of 60/345,738 filed on December 31, 2001.
2. The indicated allowability of claims 1-8, 52-59, 68-102, 107 and 108 are withdrawn in view of the newly discovered references to Sievers et al., Pressey et al. and Wakayama. Rejections based on the newly cited references follow.

Claim Objections

3. Claim 100 is objected to because of the following reasons:

In claim 100, the limitation is depend on canceled claim 99. Correction is required.

Claim Rejections - 35 USC § 102

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(f) or (g) prior art under 35 U.S.C. 103(a).

4. Claims 1, 3-6, 52 and 54-57 are rejected under 35 U.S.C. 102 (b) as being anticipated by Sievers et al., hereinafter "Sievers" (U.S. Patent No. 4,970,093).

Regarding claims 1, 5-6, 52 and 56-57, Sievers discloses a deposition composition and a method for depositing material on a substrate, the deposition composition comprising a

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supercritical fluid and a precursor of the material to be deposited on the substrate, wherein the precursor includes a meta atom [col. 5, lines 21-36].

Regarding claims 3 and 54, Sievers the supercritical fluid comprises carbon dioxide [col. 5, lines 13-20].

Regarding claims 4 and 55, Sievers discloses the composition comprises a co-solvent [col. 2, lines 18-29].

5. Claim 107 is rejected under 35 U.S.C. 102 (e) as being anticipated by Pessey et al., hereinafter "Pessey" (U.S. Patent No. 6,592,938 B1).

Regarding claim 107, Pessey discloses a method of metallization a semiconductor substrate comprising contacting the substrate with a copper metallization precursor in a supercritical fluid, to deposit copper on the substrate [col. 1, lines 32-41].

6. Claim 108 is rejected under 35 U.S.C. 102 (b) as being anticipated by Wakayama et al., hereinafter "Wakayama" (U.S. Patent No. 6,194,650 B1).

Regarding claim 108, Wakayama discloses a method of forming electrodes on a semiconductor substrate comprising contacting the substrate with an electrode material precursor in a supercritical fluid, to deposit electrode material on the substrate [Abstract and col. 8, lines 61-66].

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior

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art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 7-8, 58-59 and 72-75 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sievers in view of Marsh (U.S. Patent No. 6,284,655 B1).

Regarding claim 7-8 and 58-59, Sievers discloses all the features of the claimed invention as discussed above, but does not disclose the precursor comprises a barrier layer precursor for forming a metal nitride or metal oxynitride barrier, wherein at least one metal is selected from the group consisting of tantalum.

Marsh, however, discloses the precursor comprises a barrier layer precursor for forming a metal nitride or metal oxynitride barrier, wherein at least one metal is selected from the group consisting of tantalum [col. 11, lines 10-19].

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the above discussed teaching of Sievers as taught by Marsh for a purpose of improving the precursor in process of depositing the material on the substrate.

Regarding claim 72-75, Sievers discloses all the features of the claimed invention as discussed above, but does not disclose the supercritical fluid comprises ammonia and a precursor for forming a nitride material on the substrate at a temperature below 200°C.

Marsh, however, discloses the supercritical fluid comprises ammonia and a precursor for forming a nitride material on the substrate at a temperature below 200°C [col. 2, line 53-col. 3, line 54].

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It would have been obvious to one having ordinary skilled in the art at the time the invention was made to modify the above discussed teaching of Sievers as taught by Marsh for a purpose of improving the precursor in process of depositing the material on the substrate.

Allowable Subject Matter

8. Claims 9-51, 60-67, 103-106 and 109-115 are allowed.

The following is a statement of reason for the indication of allowable subject matter:

Claims 9-51, 60-67, 103-106 and 109-115 are considered allowable since the prior art of record and the considered pertinent to the applicant's disclosure does not teach or suggest the claimed invention. None of the prior art of record disclose or teach the claimed invention having a deposition composition for depositing material on a substrate, wherein the silicon precursor comprises cyclosiloxane as cited in claim and a deposition composition for depositing material on a substrate as cited in claim 12 and a method of forming a low k organosilicate film on a substrate, comprising contacting the substrate with a deposition composition comprising an organosilicon compound and a supercritical fluid, to deposit a silicon-containing material on the substrate, and vitrifying the silicon-containing material to form the low k organosilicate film as a porous organosilicate film on the substrate as disclosed in claim 103 and a method comprising a barrier layer precursor and a supercritical fluid, and continuing the contacting while flowing the deposition composition into the contacting zone, and discharging contacted deposition composition from the contacting zone, to effect growth of the barrier layer to a predetermined thickness as disclosed in claim 106 and a deposition composition for depositing material on a substrate as disclosed in claim 109-110.

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The limitations of claims 2, 53, 68-71 and 76-102 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Phuc T. Dang whose telephone number is (571) 272-1776. The examiner can normally be reached on 8:00 am-5:00 pm.

10. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David C. Nelms can be reached on (571) 272-1787. The fax phone numbers for the organization where this application or proceeding is assigned are 571-273-8300 for regular communications and After Final communications.

11. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

Phuc T. Dang

PP



Primary Examiner

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